CLAIMS:

1   1.   A method for detecting and compensating for color misregistration
2   comprising the steps of:
3   scanning one of a black/white edge and a solid color edge on a target;
4   generating a curve of gray values versus pixel spatial position for each color
5   channel on one of said black/white edge and said solid color edge scanned;
6   calculating a misregistration error by calculating an offset between color
7   channels; and
8   calibrating a unit using said calculated misregistration error.

1   2.   The method as recited in claim 1 further comprising the step of:
2   storing said misregistration error.

1   3.   The method as recited in claim 1, wherein said misregistration error is
2   calculated for said black/white edge scanned on said target, wherein said
3   misregistration error between a first color channel and a second color channel is equal
4   to the equation:

5            $error = diff1/diff2$

6   wherein diff1 is equal to the difference in gray values at a particular pixel
7   position between said first color channel and said second color channel; and
8   wherein diff2 is equal to the difference in gray values between neighboring
9   pixel positions in said first color channel.

9. The computer program product as recited in claim 6, wherein said misregistration error is calculated for said solid color edge scanned on said target, wherein said misregistration error between a first color channel and a second color channel is equal to the equation:

error=diff1/diff2

wherein diff1 is equal to the equation:

(GV0C2*diffGVC1/diffGVC2)-GV0C1

wherein GV0C2 is equal to the gray value at a particular pixel position for said second color channel;

wherein diffGVC1 is equal to the difference in gray values between neighboring pixel positions in said first color channel;

wherein diffGVC2 is equal to the difference in gray values between neighboring pixel positions in said second color channel; and

wherein GV0C1 is equal to the gray value at a particular pixel position for said first color channel; and

wherein diff2 is equal to the difference in gray values between neighboring pixel positions in said second color channel.

10. The computer program product as recited in claim 6, wherein said programming step of calculating said misregistration error comprises the programming steps of:

fitting a second order curve to a plurality of data points on said curve of gray values for a first and a second color channel; and

determining a lateral shift required to align one or more of said plurality of data points for said first and said second color channel.

1   4.   The method as recited in claim 1, wherein said misregistration error is

2   calculated for said solid color edge scanned on said target, wherein said

3   misregistration error between a first color channel and a second color channel is equal

4   to the equation:

5   error=diff1/diff2

6   wherein diff1 is equal to the equation:

7   (GV0C2*diffGVC1/diffGVC2)-GV0C1

8   wherein GV0C2 is equal to the gray value at a particular pixel position

9   for said second color channel;

10   wherein diffGVC1 is equal to the difference in gray values between

11   neighboring pixel positions in said first color channel;

12   wherein diffGVC2 is equal to the difference in gray values between

13   neighboring pixel positions in said second color channel; and

14   wherein GV0C1 is equal to the gray value at a particular pixel position

15   for said first color channel; and

16   wherein diff2 is equal to the difference in gray values between neighboring

17   pixel positions in said first color channel.

1   5.   The method as recited in claim 1, wherein said step of calculating said

2   misregistration error comprises the steps of:

3   fitting a second order curve to a plurality of data points on said curve of gray

4   values for a first and a second color channel; and

5   determining a lateral shift required to align one or more of said plurality of

6   data points for said first and said second color channel.

1   6.   A computer program product embodied in a machine readable medium for

2   detecting and compensating for color misregistration comprising the programming

3   steps of:

4   generating a curve of gray values versus pixel spatial position for each color

5   channel on one of a black/white edge and a solid color edge scanned on a target;

6   calculating a misregistration error by calculating an offset between color

7   channels; and

8   calibrating a unit using said calculated misregistration error.

1   7.   The computer program product as recited in claim 6 further comprising the

2   programming step of:

3   storing said misregistration error.

1   8.   The computer program product as recited in claim 6, wherein said

2   misregistration error is calculated for said black/white edge scanned on said target,

3   wherein said misregistration error between a first color channel and a second color

4   channel is equal to the equation:

5   error=diff1/diff2

6   wherein diff1 is equal to the difference in gray values at a particular pixel

7   position between said first color channel and said second color channel; and

8   wherein diff2 is equal to the difference in gray values between neighboring

9   pixel positions in said first color channel.

1   11.   A system, comprising:

2   a memory operable for storing a computer program for detecting and

3   compensating for color misregistration;

4   a processor coupled to said memory, wherein said processor, responsive to

5   said computer program, comprises:

6   circuitry operable for generating a curve of gray values versus pixel

7   spatial position for each color channel on one of a black/white edge and a solid color

8   edge scanned on a target;

9   circuitry operable for calculating a misregistration error by calculating

10   an offset between color channels; and

11   circuitry operable for calibrating a unit using said calculated

12   misregistration error.

1   12.   The system as recited in claim 11, wherein said processor further comprises:

2   circuitry operable for storing said misregistration error.

1   13.   The system as recited in claim 11, wherein said misregistration error is

2   calculated for said black/white edge scanned on said target, wherein said

3   misregistration error between a first color channel and a second color channel is equal

4   to the equation:

5   error=diff1/diff2

6   wherein diff1 is equal to the difference in gray values at a particular pixel

7   position between said first color channel and said second color channel; and

8   wherein diff2 is equal to the difference in gray values between neighboring

9   pixel positions in said first color channel.

1   14.   The system as recited in claim 11, wherein said misregistration error is
2   calculated for said solid color edge scanned on said target, wherein said
3   misregistration error between a first color channel and a second color channel is equal
4   to the equation:

5   error=diff1/diff2

6   wherein diff1 is equal to the equation:
7   (GV0C2*diffGVC1/diffGVC2)-GV0C1
8   wherein GV0C2 is equal to the gray value at a particular pixel position
9   for said second color channel;
10   wherein diffGVC1 is equal to the difference in gray values between
11   neighboring pixel positions in said first color channel;
12   wherein diffGVC2 is equal to the difference in gray values between
13   neighboring pixel positions in said second color channel; and
14   wherein GV0C1 is equal to the gray value at a particular pixel position
15   for said first color channel; and
16   wherein diff2 is equal to the difference in gray values between neighboring
17   pixel positions in said first color channel.

1   15.   The system as recited in claim 11, wherein said circuitry operable for
2   calculating said misregistration error comprises:
3   circuitry operable for fitting a second order curve to a plurality of data points
4   on said curve of gray values for a first and a second color channel; and
5   circuitry operable for determining a lateral shift required to align one or more
6   of said plurality of data points for said first and said second color channel.

1   16.   A scanner, comprising:

2   a reading unit, wherein said reading unit comprises:

3   an illumination source configured to emit light onto a surface; and

4   a plurality of charge coupled device arrays configured to store electric

5 charge from light reflected from said surface;

6   a controller coupled to said reading unit, wherein said controller is configured

7 to sequentially activate said plurality of charge coupled device arrays, wherein said

8 controller is further configured to output said electrical charge stored in said plurality

9 of charge coupled device arrays as digital signals, wherein said controller comprises:

10   a memory operable for storing a computer program for detecting and

11 compensating for color misregistration; and

12   a processor coupled to said memory, wherein said processor,

13 responsive to said computer program, comprises:

14   circuitry operable for generating a curve of gray values versus

15 pixel spatial position for each color channel on one of a black/white edge and a solid

16 color edge scanned on a target;

17   circuitry operable for calculating a misregistration error by

18 calculating an offset between color channels; and

19   circuitry operable for calibrating said scanner using said

20 calculated misregistration error.

1   17.   The system as recited in claim 16, wherein said processor further comprises:

2   circuitry operable for storing said misregistration error.

1   18.   The system as recited in claim 16, wherein said misregistration error is

2   calculated for said black/white edge scanned on said target, wherein said

3   misregistration error between a first color channel and a second color channel is equal

4   to the equation:

5   error=diff1/diff2

6   wherein diff1 is equal to the difference in gray values at a particular pixel

7   position between said first color channel and said second color channel; and

8   wherein diff2 is equal to the difference in gray values between neighboring

9   pixel positions in said first color channel.

1   19.   The system as recited in claim 16, wherein said misregistration error is

2   calculated for said solid color edge scanned on said target, wherein said

3   misregistration error between a first color channel and a second color channel is equal

4   to the equation:

5   error=diff1/diff2

6   wherein diff1 is equal to the equation:

7   (GV0C2*diffGVC1/diffGVC2)-GV0C1

8   wherein GV0C2 is equal to the gray value at a particular pixel position

9   for said second color channel;

10   wherein diffGVC1 is equal to the difference in gray values between

11   neighboring pixel positions in said first color channel;

12   wherein diffGVC2 is equal to the difference in gray values between

13   neighboring pixel positions in said second color channel; and

14   wherein GV0C1 is equal to the gray value at a particular pixel position

15   for said first color channel; and

16   wherein diff2 is equal to the difference in gray values between neighboring
17   pixel positions in said first color channel.

1   20.   The system as recited in claim 16, wherein said circuitry operable for
2   calculating said misregistration error comprises:
3   circuitry operable for fitting a second order curve to a plurality of data points
4   on said curve of gray values for a first and a second color channel; and
5   circuitry operable for determining a lateral shift required to align one or more
6   of said plurality of data points for said first and said second color channel.